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Danfoss - Ames

Part I: Overview of Business

Designs, manufactures, and markets engineered hydraulic and electronic systems and components for use primarily in applications of mobile equipment. The company has sales, manufacturing, and engineering capabilities globally. Danfoss is one of the worldwide leaders in the design, manufacture and sale of engineered hydraulic and electronic systems and components. It is a comprehensive supplier of mobile hydraulic solutions as either components or integrated systems. These systems are used primarily in applications of mobile equipment. Its product range includes hydrostatic transmissions, steering components, motors and valves, and open-circuit pumps and electrohydraulic controls. The company, with approximately 8,500 employees worldwide, has sales, manufacturing and engineering capabilities in Europe, the Americas and the Asia-Pacific region. It also develops new products and solutions in partnership with its customers.

Part II: Job Specifics

Danfoss fabrication is a department that receives work orders from various departments from the production line throughout all products that are made. These work orders are usually items that will enable the production line to complete tasks as efficiently and safely as possible. The items range from lifting devices to move parts around for assembly, leak proof work stations that will contain all the fluids used in the plant from getting on the floor to tool holding stations to organize tools in one location that are required for the assembly of the products. The fabrication department employees need to be knowledgeable in all forms of welding processes, machining, tool and die, blue print reading, drafting and CAD.

Part III: Introduce the Problem

You are working in the fabrication department at Danfoss Power Solutions. In the plant there are lifting requirements that the company has set for lifting objects in the plant. The requirement is that no employee of Danfoss will lift any item weighing more than 35lbs. Since the forklift drivers main function is to keep each production line supplied with the parts they need, the individual team leaders from each department would like for you to design two wheeled carts that will be used by employees to haul items instead of taking the forklift drivers away from their main job. The carts need to be able to move objects that weigh up to 300lbs. They would like some of the carts to have built in straps so the items hauled can be strapped to the cart.

Part IV: Background

The students will need to have a basic understanding of metal characteristics to select the best material for the job. They will need to have an understanding of the different welding processes and which one would be the best suited to use. They will need a good understanding of design to produce a plan to include the information needed to produce a quality and usable product. The will need to understand how to use the fabrication machine to be able to bend the metal to proper size and angle.

Part V: Business Solution

The fabrication team would first make a list of all requirements that need to be included in the product. They would develop a drawing that would include the required information needed to make the product safe for the user (size of cart, size of material to use, strength of cart for its intended use). They would use CAD to develop a 3-D image of the product and detailed working drawings to make sure the cart could be assembled as designed.

Part VI: Student Solutions

I would first of all like to see the students brainstorm different ideas and follow a design process to come up with the best possible solution. I think it would be great if the class would be able to develop two different designs of carts to get them to understand there might not only be one solution to a problem. Determine as a group what processes would be used to complete the product to meet all the requirements.